MHS IM/IT Program

Enterprise Architecture

"Blueprints for Success: Building Strong Foundations Through Enterprise Architecture"

HIMSS Conference: 16 February 2005

Military Health System Presenters

- **Ms. Connie Gladding – Chief Enterprise Architect**

- **Ms. Sherry McKenzie – Operational Architect**

- **Ms. Nancy Orvis – Data Architect**

- **Ms. Stephanie Boyles – Technical Standards Architect**

Overview

- **Describe MHS Enterprise Architecture and its benefits**

- **Identify DoD Health Enterprise Architecture components**

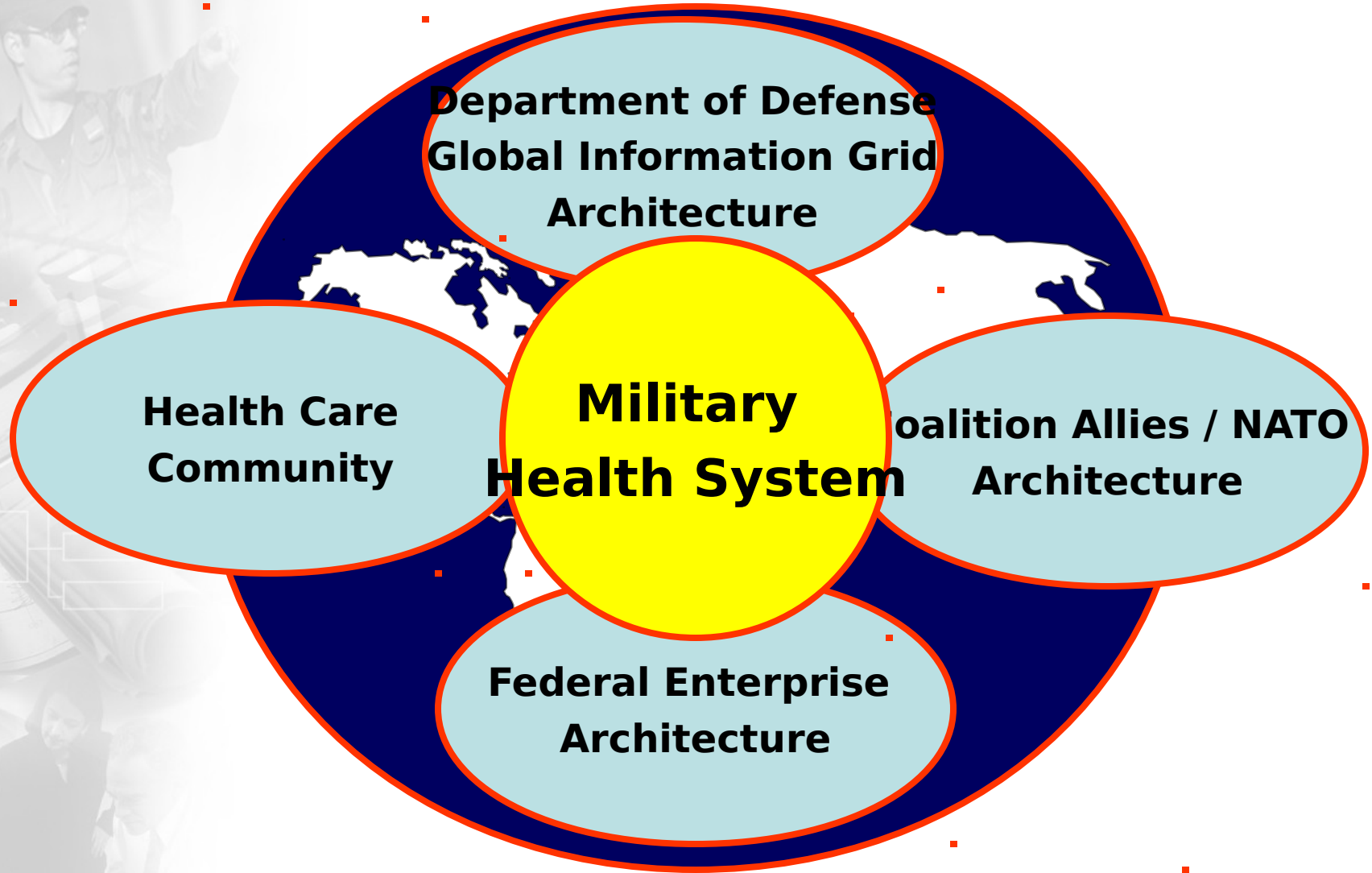- **Illustrate DoD MHS Enterprise Architecture effects**

Who Are We?
Military Health System Statistics

- **$37 Billion Operations**
  - Anticipated to be $50 billion in 5 years

- **9.1 million eligible beneficiarie**

- **70 hospitals & medical centers**

- **411 medical clinics**

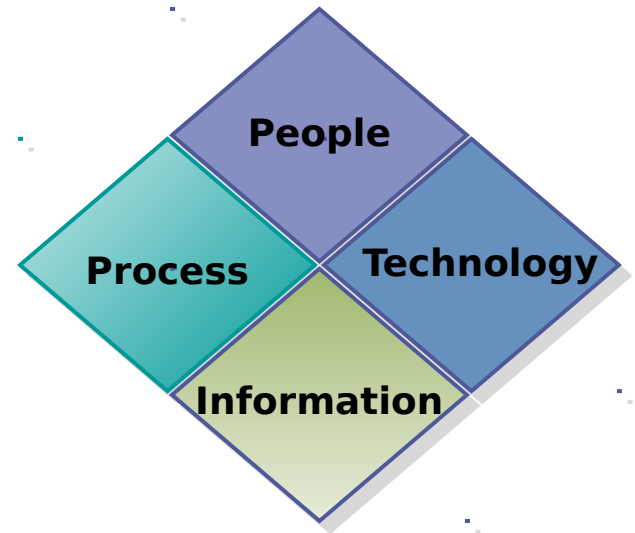- **130,800 personnel**

- **1.7 million outpatient visits/week**
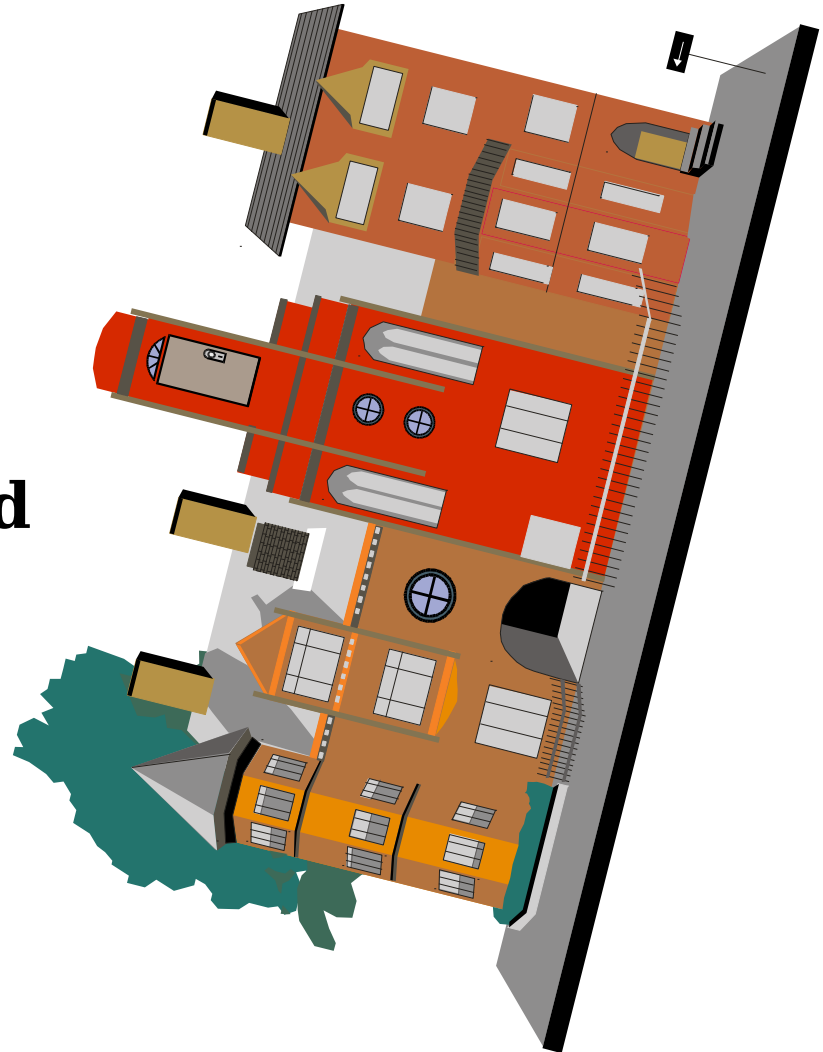
Our Military Health Environment

Department of Defense Global Information Grid Architecture

Health Care Community

Military Health System

Coalition Allies / NATO Architecture

Federal Enterprise Architecture

Architecture-Blueprint

People

Process

Technology

Information

Architecture development serves the same
purpose as a blueprint for constructing a building

What is Enterprise Architecture?

- **Defines "Big Picture of organization and how it works together"**

- **Displays strategic, future ("To Be") views of organization's processes, technology, standards and their interrelationships**

- **Provides plan for transitioning processes, systems, and implementing new technologies**

Building Towards the "To Be"

"As-Is" — Baseline inventory of technology resources and business processes

Migration Plan — How to move the Enterprise toward the evolving "To-Be" state
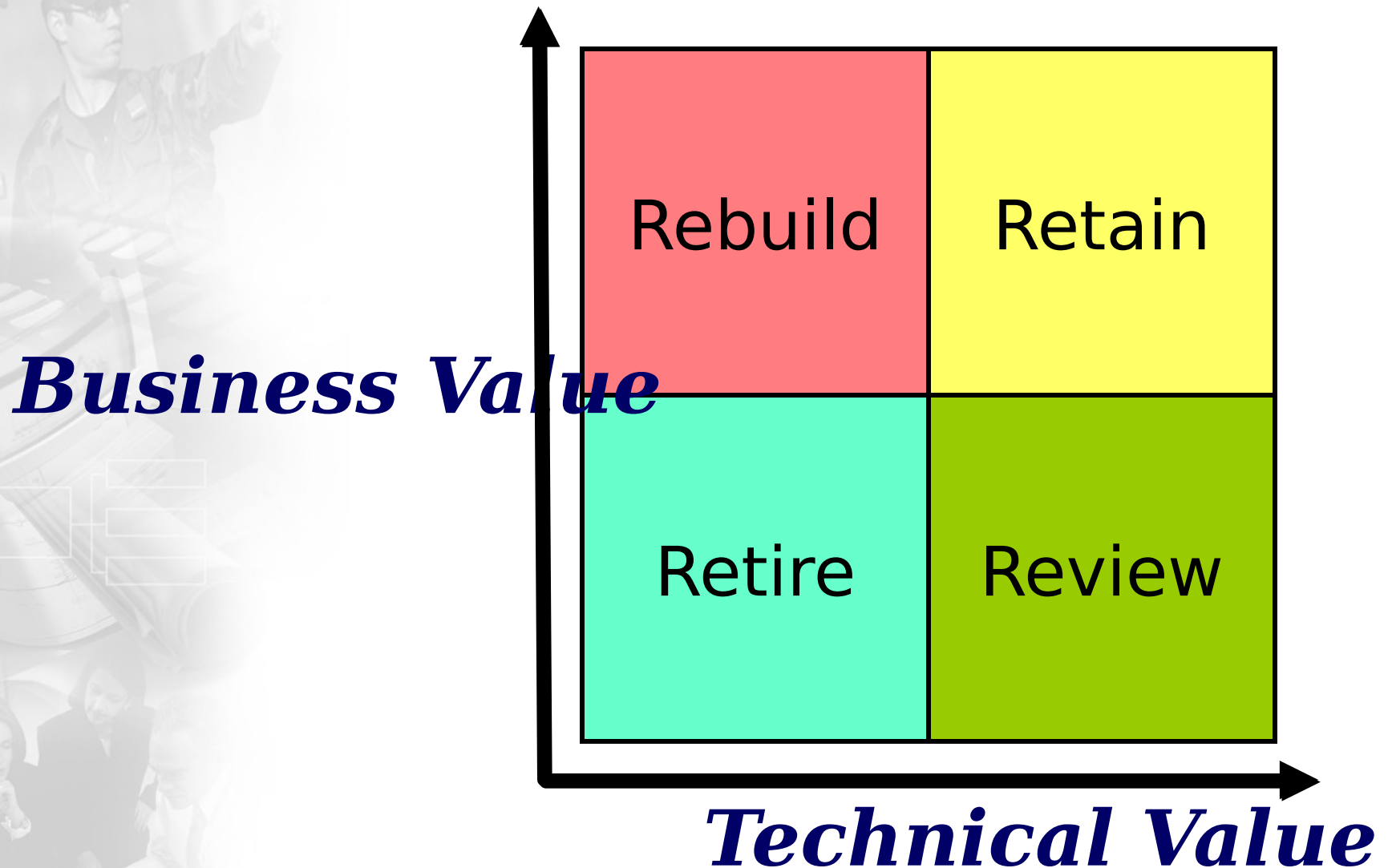
"To-Be" Architecture — Business, Data, Application, Technology
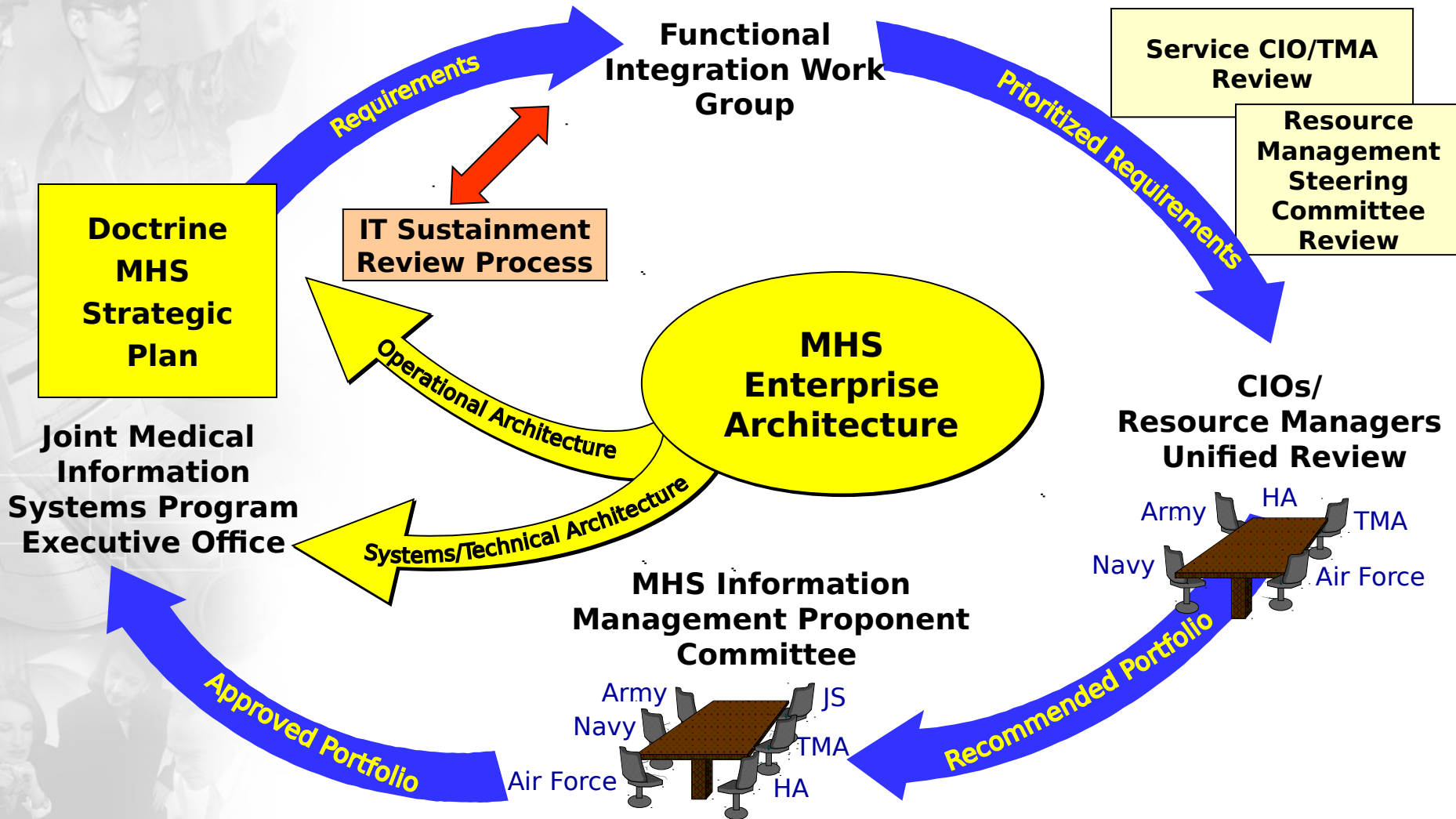
Rationalizing Applications

Military Health System
IT Capital Investment Portfolio Process

Functional Integration Work Group

Requirements

Prioritized Requirements

Service CIO/TMA Review

Resource Management Steering Committee Review

Doctrine MHS Strategic Plan

IT Sustainment Review Process

MHS Enterprise Architecture

Operational Architecture

Systems/Technical Architecture

Joint Medical Information Systems Program Executive Office

CIOs/ Resource Managers Unified Review

Army HA TMA Navy Air Force

MHS Information Management Proponent Committee

Army JS Navy TMA Air Force HA

Recommended Portfolio

Approved Portfolio

Business Drivers

- **MHS Strategic Plan**
- **Force Health Protection**
- **Clinger-Cohen & HIPAA**
- **Security/Information Assurance**
- **DoD Net-centric Transformation**
- **DoD Business Modernization**
- **Joint Medical Command**
- **Need to maximize resources**
- **National Electronic Health Record Initiative**

Benefits of Enterprise Architecture

- **Documents leaderships vision for the organization**
- **Guides business transformation and modernization**
- **Aligns investments with business priorities**
- **Assists in the management of complexities**
- **Improves efficiencies**
- **Improves customer satisfaction**
- **Improves patient safety**
- **Supports interoperability**
- **Educate staff**
- **Documents clear, commonly understood terminology**

What are the components of MHS EA?

MHS Business Processes & Operational Architecture

Systems Architecture
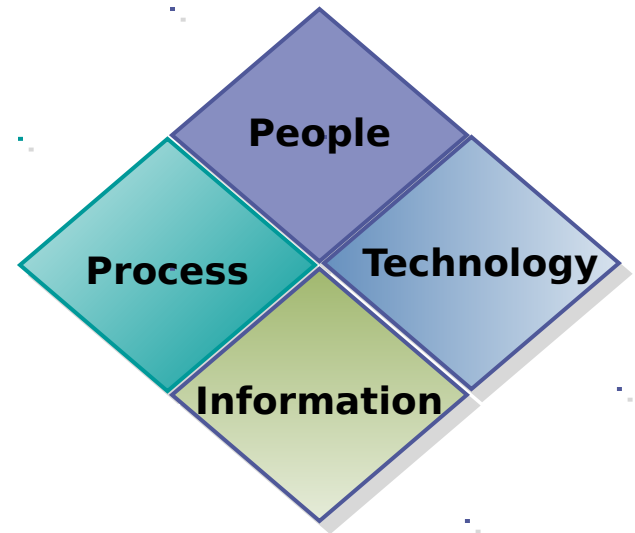
Technical Standards Architecture

Challenges

- **Building the right functionality**

- **Avoiding duplicative efforts**

- **Achieving speed to market**

- **Getting high-quality at minimal cost**

- **Adding new capabilities while maintaining installed base**
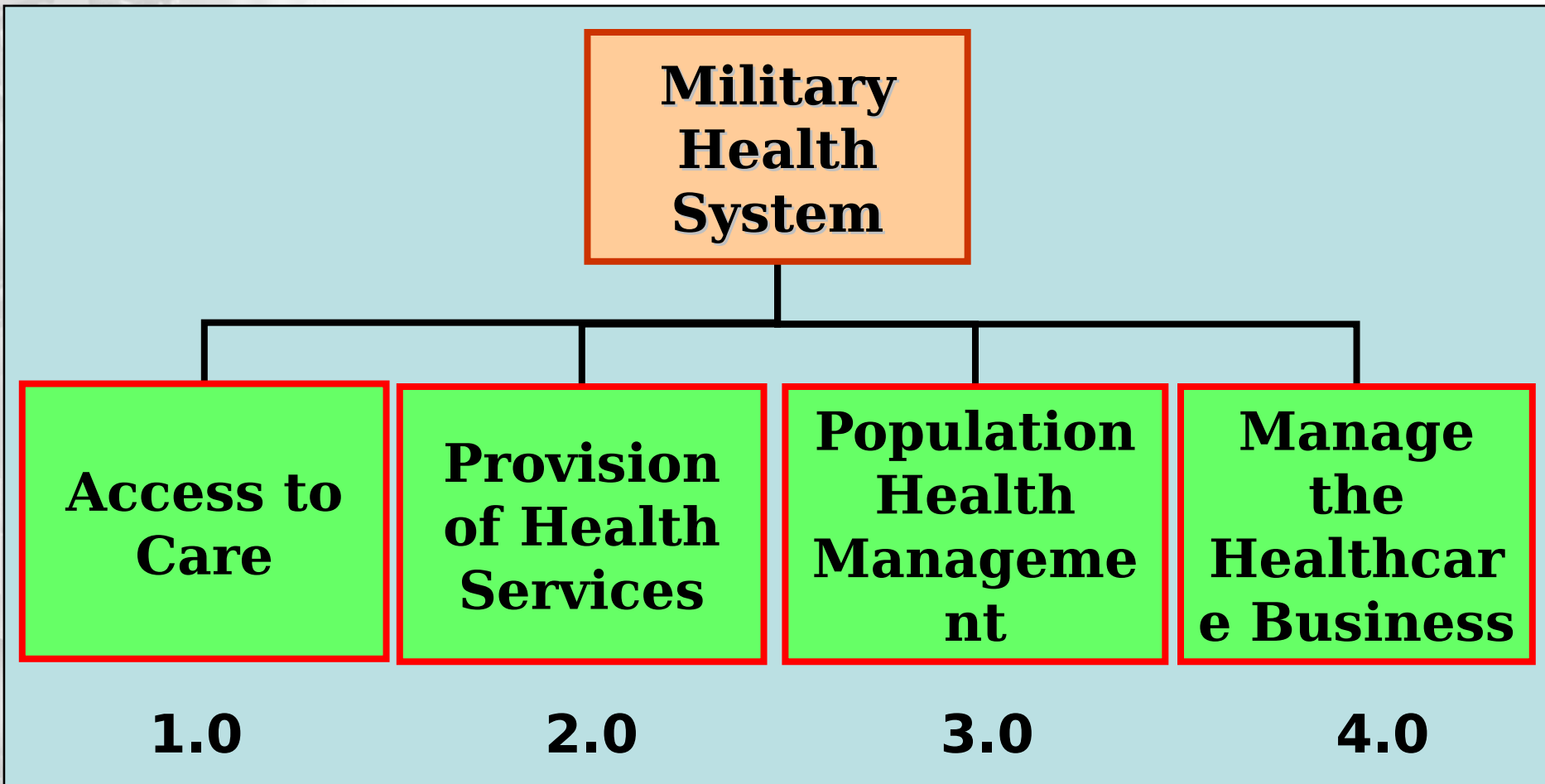
- **Leveraging other initiatives**
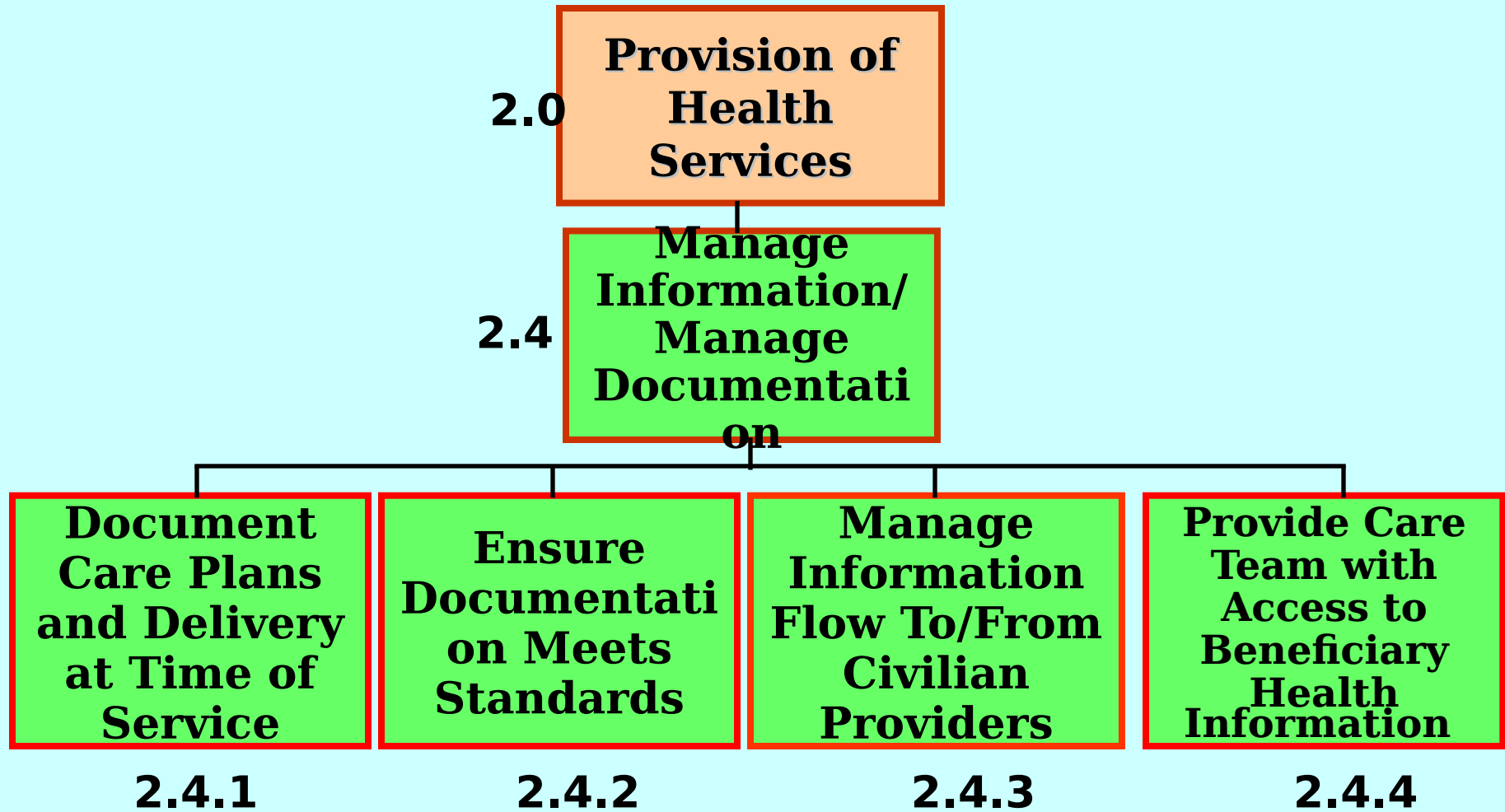
Operational Architecture

- People
- Process
- Technology
- Information

Define business activities, processes, and information requirements

Core Business Processes

Military Health System

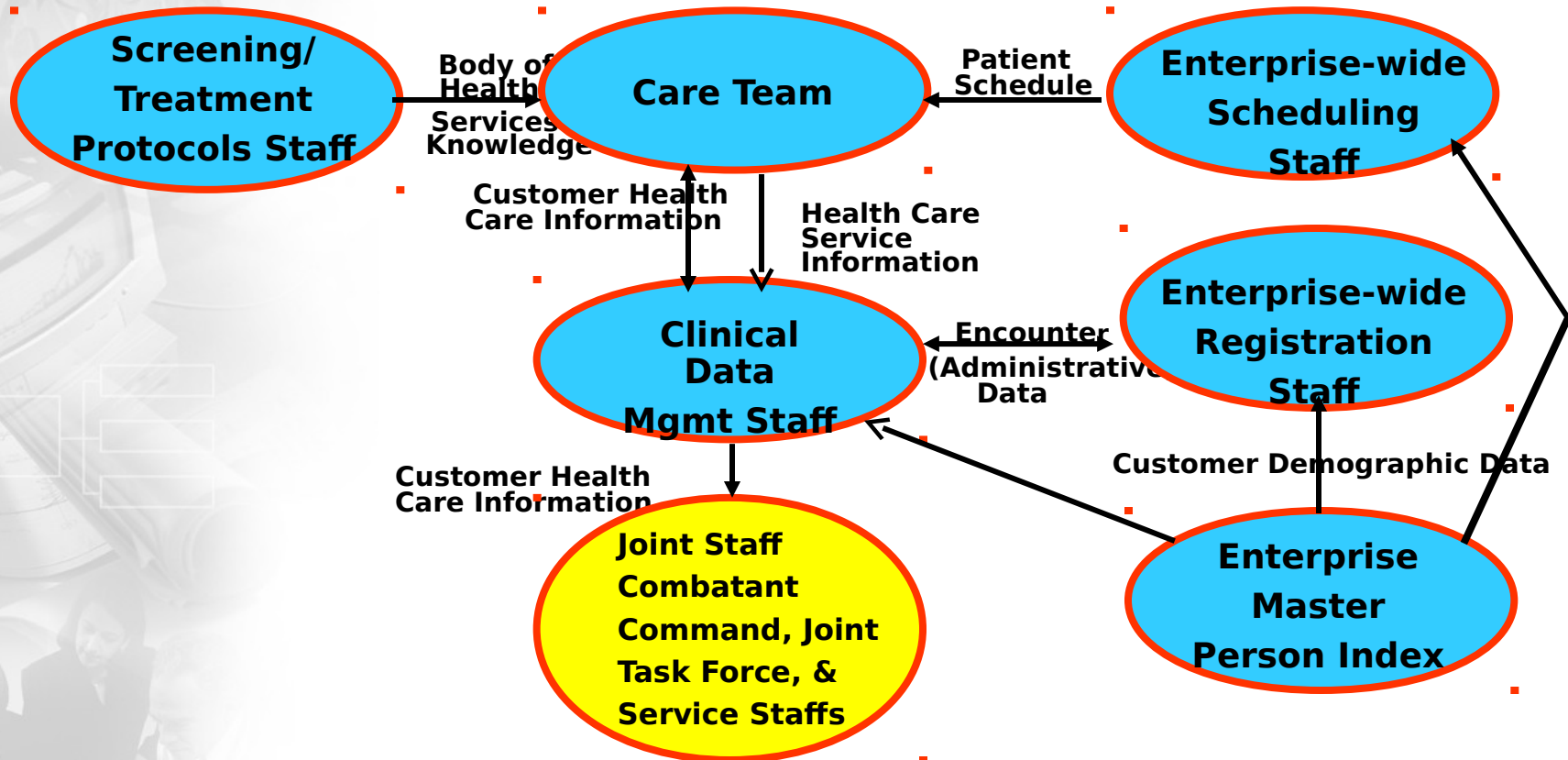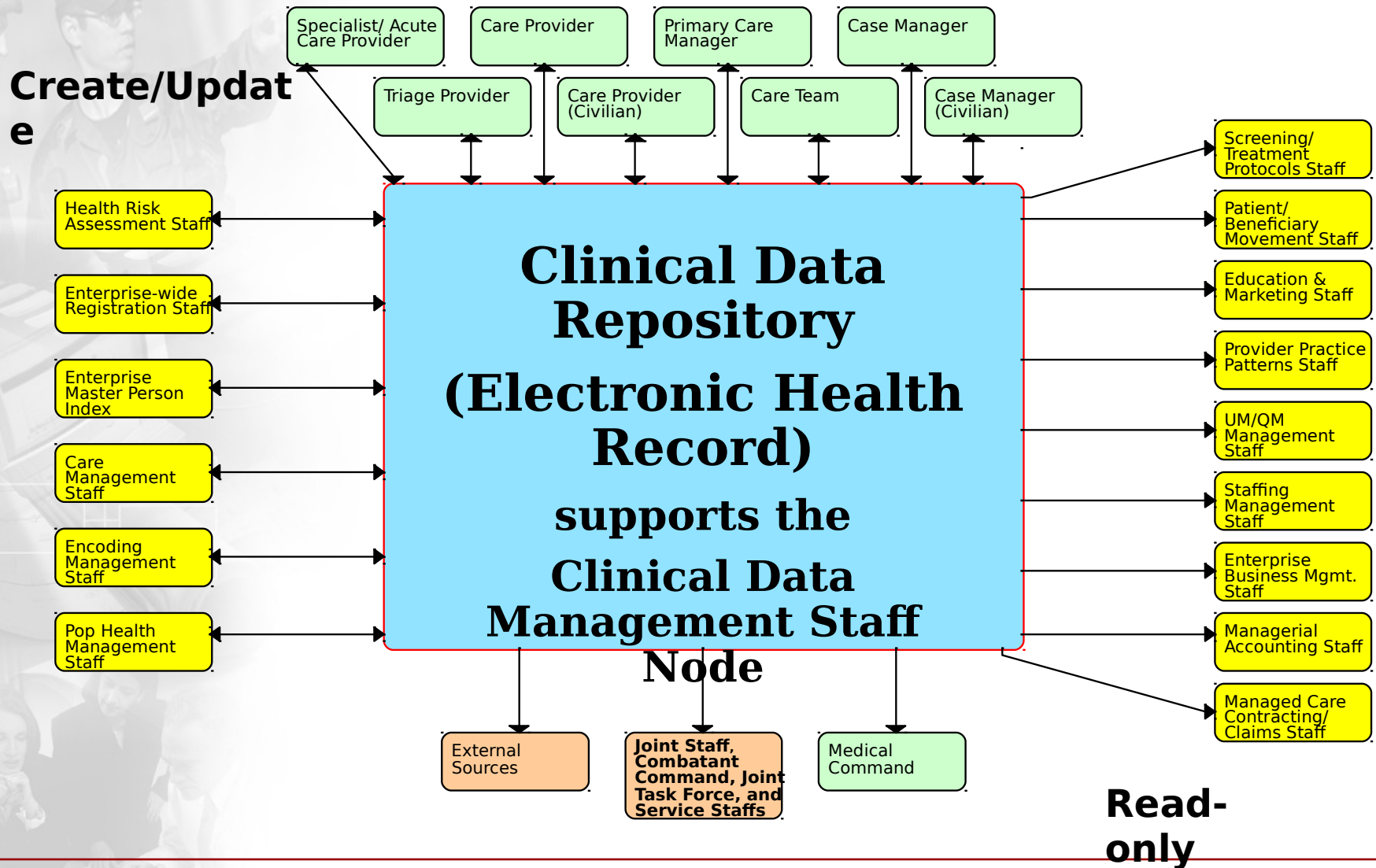| Access to Care	Provision of Health Services	Population Health Management	Manage the Healthcare Business
1.0	2.0	3.0	4.0

Activity Model

Information Exchange Requirements

OV-2 2.4.1 Document Care Plans and Delivery at Time of Service

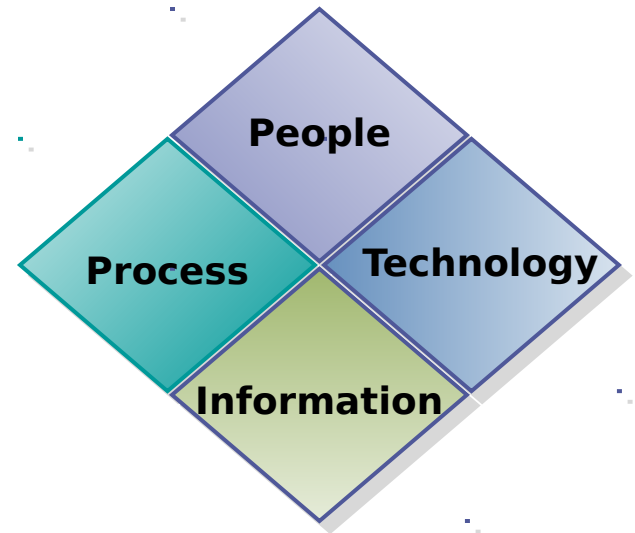# Electronic Health Record Critical Interfaces

Create/Update

Specialist/ Acute Care Provider

Care Provider

Primary Care Manager

Case Manager

Triage Provider

Care Provider (Civilian)

Care Team

Case Manager (Civilian)

Health Risk Assessment Staff

Enterprise-wide Registration Staff

Enterprise Master Person Index

Care Management Staff

Encoding Management Staff

Pop Health Management Staff

Clinical Data Repository

(Electronic Health Record)

supports the

Clinical Data Management Staff Node

Screening/ Treatment Protocols Staff

Patient/ Beneficiary Movement Staff

Education & Marketing Staff

Provider Practice Patterns Staff

UM/QM Management Staff

Staffing Management Staff

Enterprise Business Mgmt. Staff

Managerial Accounting Staff

Managed Care Contracting/ Claims Staff

External Sources

Joint Staff, Combatant Command, Joint Task Force, and Service Staffs
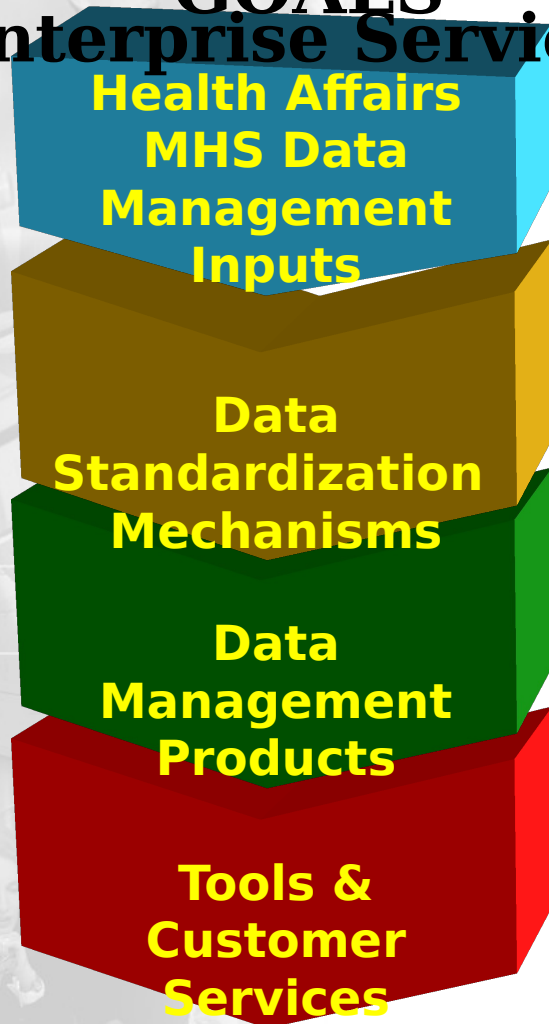
Medical Command

Read-only

Business Process Model

Health Data Architecture

Data architecture and standards supply the structure, context and meaning to information requirements

Managing Information through An Architecture Framework

GOALS →

Enterprise Services

- Health Affairs MHS Data Management Inputs
- Data Standardization Mechanisms
- Data Management Products
- Tools & Customer Services

Support Net-Centric

Shared Data Environment Interoperability

Information Exchange Name	No	%
Customer Health Care Information	76	28.4%
Customer Demographic Data	54	20.1%
Encounter (Administrative) Data	54	20.1%
Customer Risk Factors	48	17.9%

Linking Data Standards to Information Exchange Requirements

- **MHS Enterprise Architecture Version 4.0**
- **Information Exchange ID # 2353: Coding Information**

Example:

X12N 837 - Health Care Claim **mandated by HIPAA**

Code Set Description: X12N Gender Codes

» **F   Female**

» **M   Male**

» **U   Unknown**

OV-2 4.2.5 Manage Accounts Receivable and Collections

Managed Care
Contracting/
Claims Staff

Contract/Claims
Processing Information

DoD Finance
and Accounting
Organizations

Collection
Information

Encoding
Management
Staff

Coding
Information

Accounts
Receivable
Mgmt Staff

Collection
Information

Bill

External Payor

General
Ledger

Accounts
Receivable
Information

General
Financials Staff

How Business Roles Link Data to Activities

MHS Data Standards List

Vendors must use MHS Data Standards as specified in the contract language

- **Baseline and Target Standards Listed**
- **Standards for Data Representation, Information Modeling & Message Formats**
- **Examples:**
  - **Lab and Clinical Observation Codes: LOINC**
  - **Multiaxial Medical Nomenclature: SNOMED CT**

Consolidated Health Informatics

The Official Web Site of the President's E-Government Initiatives

E-Gov Home | Contacts | Privacy | Site Map | Contact E-Gov

Content that was previously at this site is now located at:
eStrategy eGov Strategies

About E-Gov
E-Gov at a Glance
Press Releases
Events
Links

Search egov.gov
[   ] Go

Government to Citizen

Government to Government

Government to Business

Internal Efficiency & Effectiveness

E-Authentication

Reducing burden on businesses by adopting processes to streamline data collection & eliminate redundancies

Government to Business

G2B Portfolio > Consolidated Health Informatics

Consolidated Health Informatics

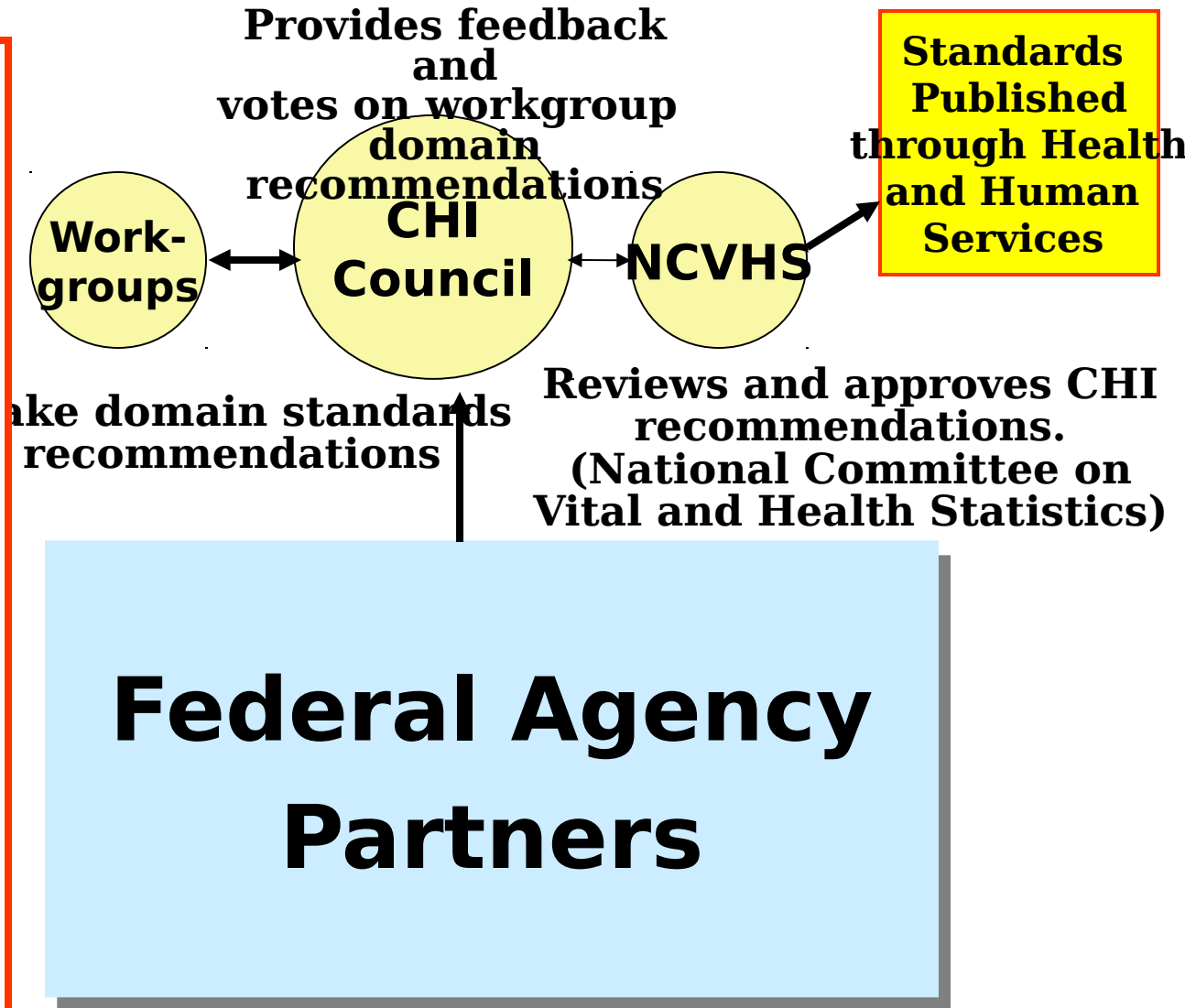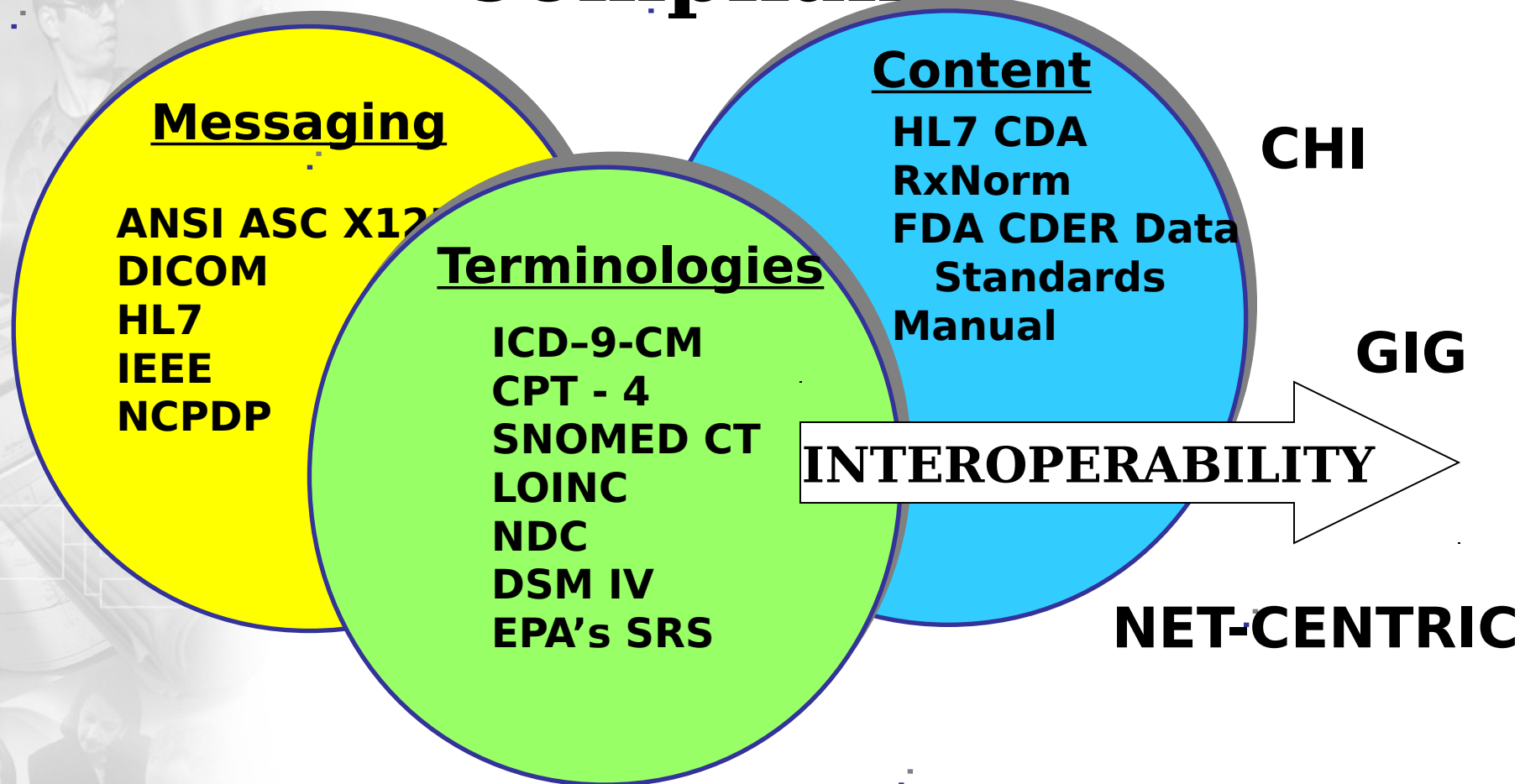|		
Program Managers	:	Karen Trudel, Program Manager CAPT Cynthia Wark, Deputy Program Manager
Description	:	Adopts a portfolio of existing health information interoperability standards (health vocabulary and messaging) enabling all agencies in the federal health enterprise to "speak the same language" based on common enterprise-wide business and information technology architectures.
Progress to Date	:	• Government-wide health IT governance council established • Portfolio of 24 target domains for data and messaging standards identified • Four messaging and one health vocabulary standard adopted government-wide; additional vocabulary standards being reviewed • Partnerships with 23 federal agencies/departments who use health data for agreements to build adopted standards into their health IT architecture • Regular meetings with industry to prevent major incompatibilities in partnership with the National Committee on Vital and Health Statistics
Next Steps	:	• Deploy teams staffed with subject matter experts and report

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DoD Adopts CHI Recommendations

CHI DOMAINS
[See **www.egov.gov** for complete set]

- **Anatomy**
- **Billing/Financial**
- **Chemicals**
- **Demographics**
- **Diagnosis and Problem List**
- **Encounters**
- **Genes**
- **Immunizations**
  and more……..

Provides feedback and votes on workgroup domain recommendations

Work-groups

CHI Council

NCVHS

Standards Published through Health and Human Services

Make domain standards recommendations

Reviews and approves CHI recommendations.
(National Committee on Vital and Health Statistics)

Federal Agency Partners

Health Data Standards Compliance

Messaging

ANSI ASC X12
DICOM
HL7
IEEE
NCPDP

Terminologies

ICD–9-CM
CPT - 4
SNOMED CT
LOINC
NDC
DSM IV
EPA's SRS

Content

HL7 CDA
RxNorm
FDA CDER Data
** Standards**
Manual

CHI

GIG

INTEROPERABILITY

NET-CENTRIC

Determine the standards you must follow

System Architecture

People

Process

Technology

Information

Identify applications and be able to map them to business capabilities

Military Health System "As-Is" Application Architecture
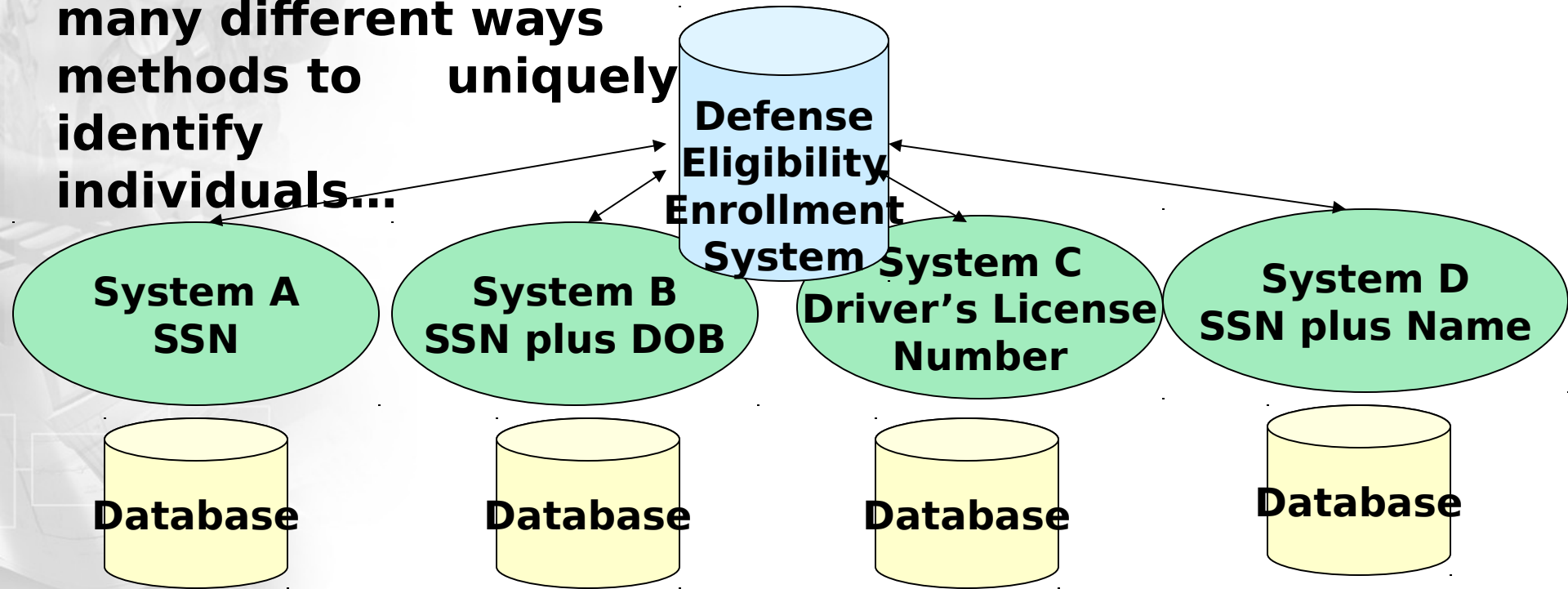
Sample "To-Be" System Architecture

As of 11/03

Potential Opportunities for Service- Oriented Architecture Components

- **Patient or Person Identification Service (PIDS) and   MSI**
- **Security (IAA)**
- **Data Dictionary & Lexical Services**
- **Local Data Store**
- **Messaging & Logical Transformation**
- **Workflow Services**
- **Order Entry**
- **Results Retrieval**
- **Encounter Documentation**

Example: Using Service-Oriented Architecture (SOA) for Person Identification

AS IS: We currently use many different ways methods to uniquely identify individuals...
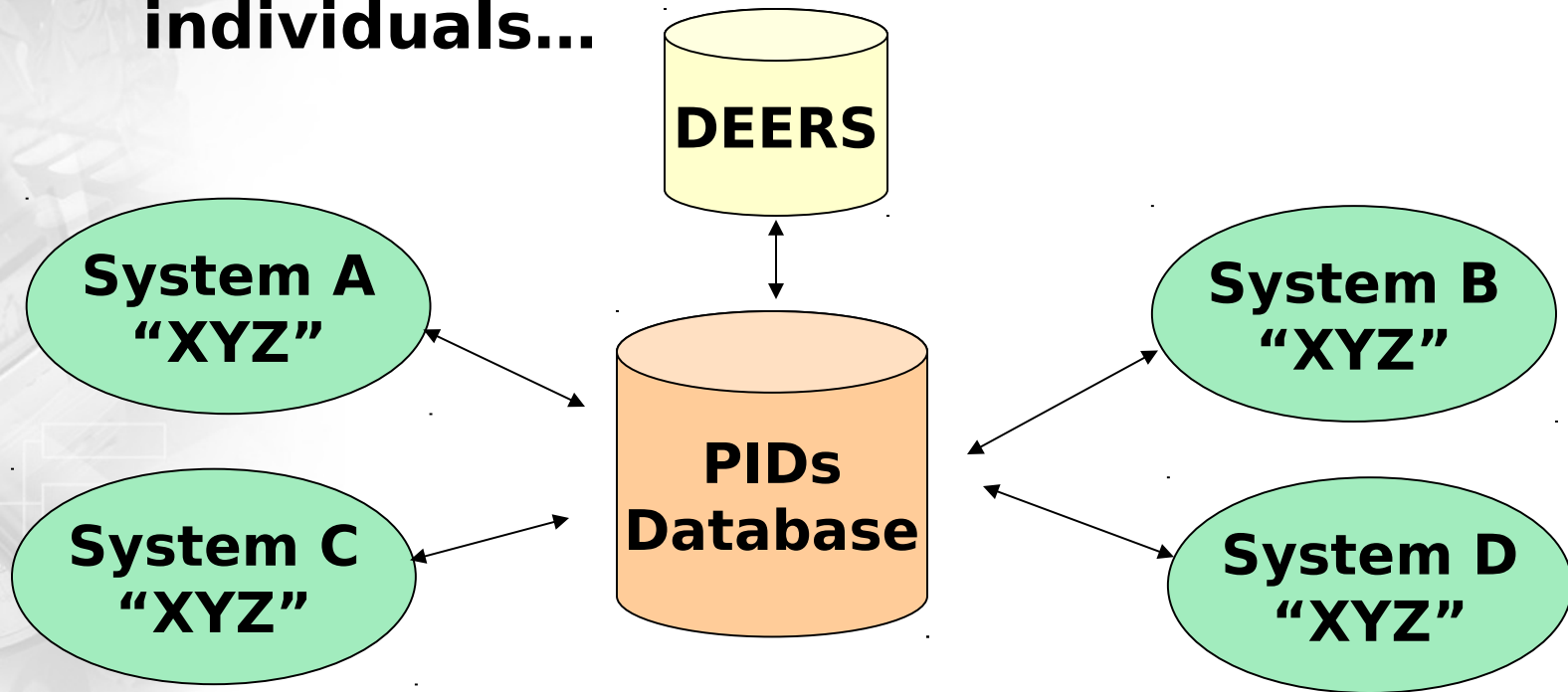
Defense Eligibility Enrollment System

System A SSN

System B SSN plus DOB

System C Driver's License Number

System D SSN plus Name

Database

Database

Database

Database

Which means every system maintains:

- **A database of individuals**
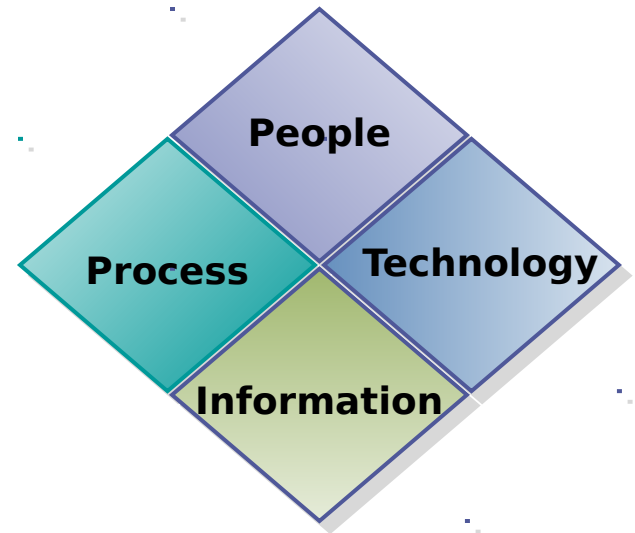
- **A DEERS interface**

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Example: Using Service-Oriented Architecture (SOA) for Person Identification

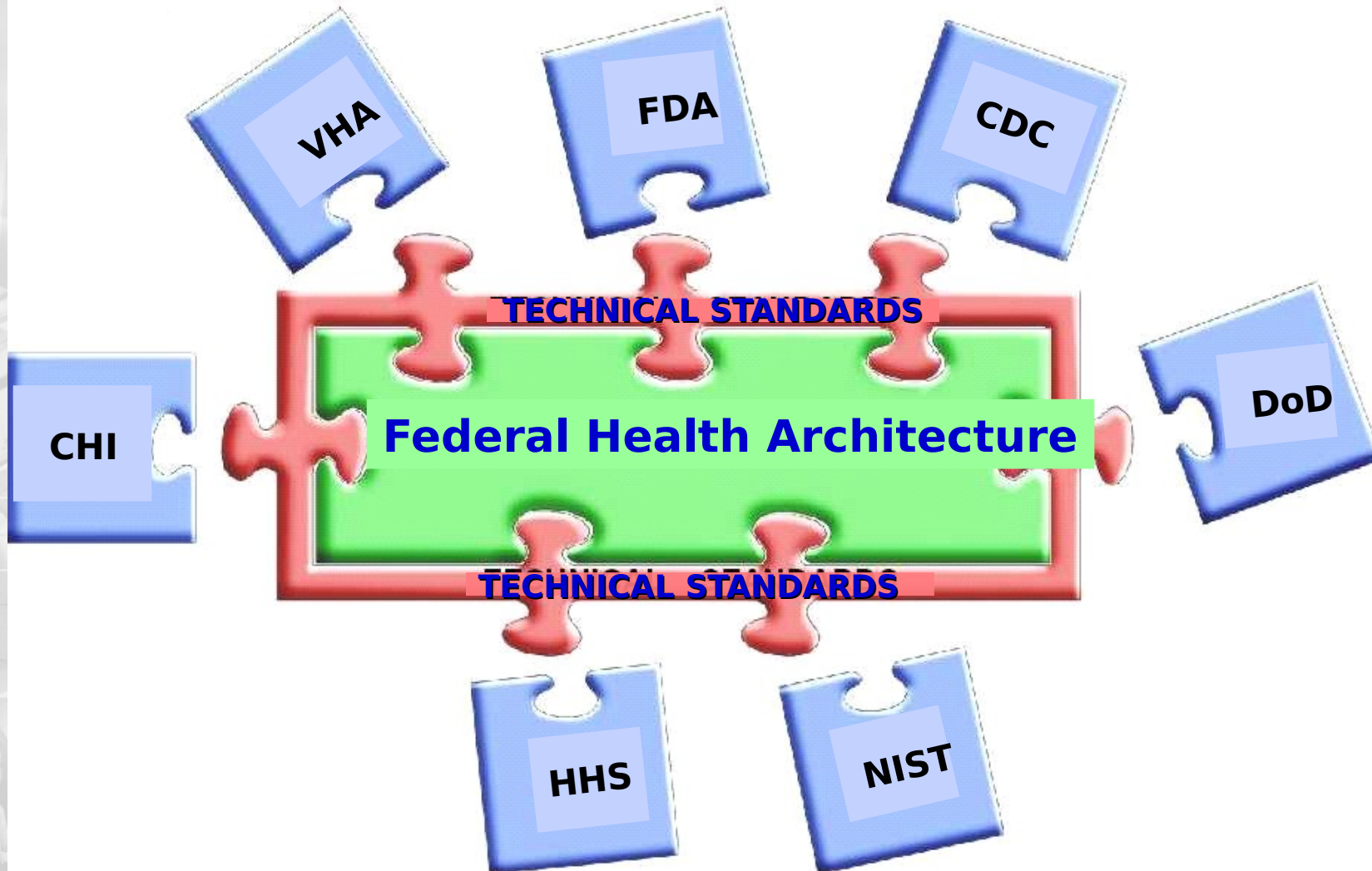**TO BE: Standardizing the method used to uniquely identify individuals…**

DEERS

System A "XYZ"

System B "XYZ"

PIDs Database

System C "XYZ"

System D "XYZ"

Allows one Patient Database and DEERS Interface to support all systems…

Technical Standards Architecture

People

Process

Technology

Information

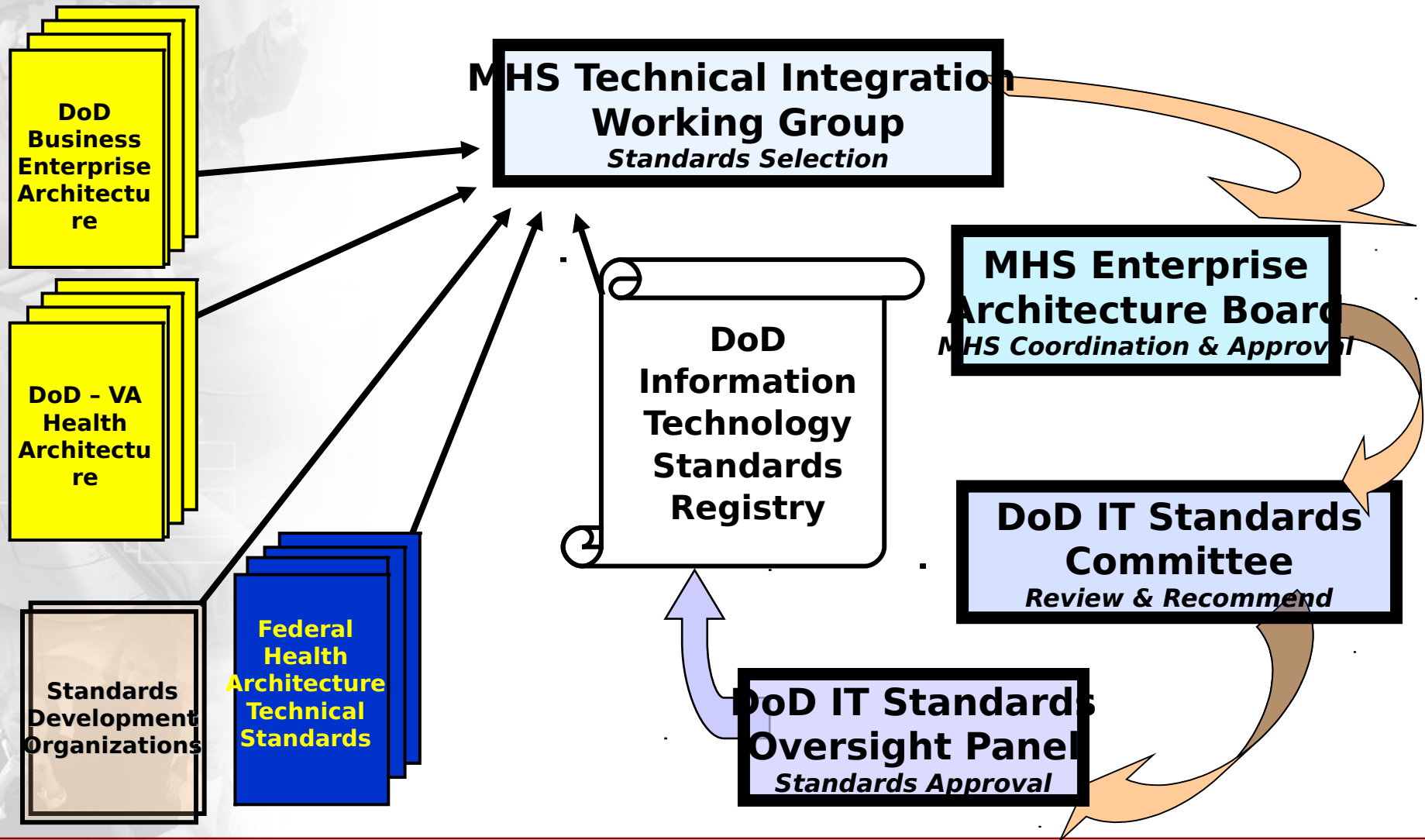*Determine the technical standards that support interoperability*

Federal Standards Collaboration Process

VHA

FDA

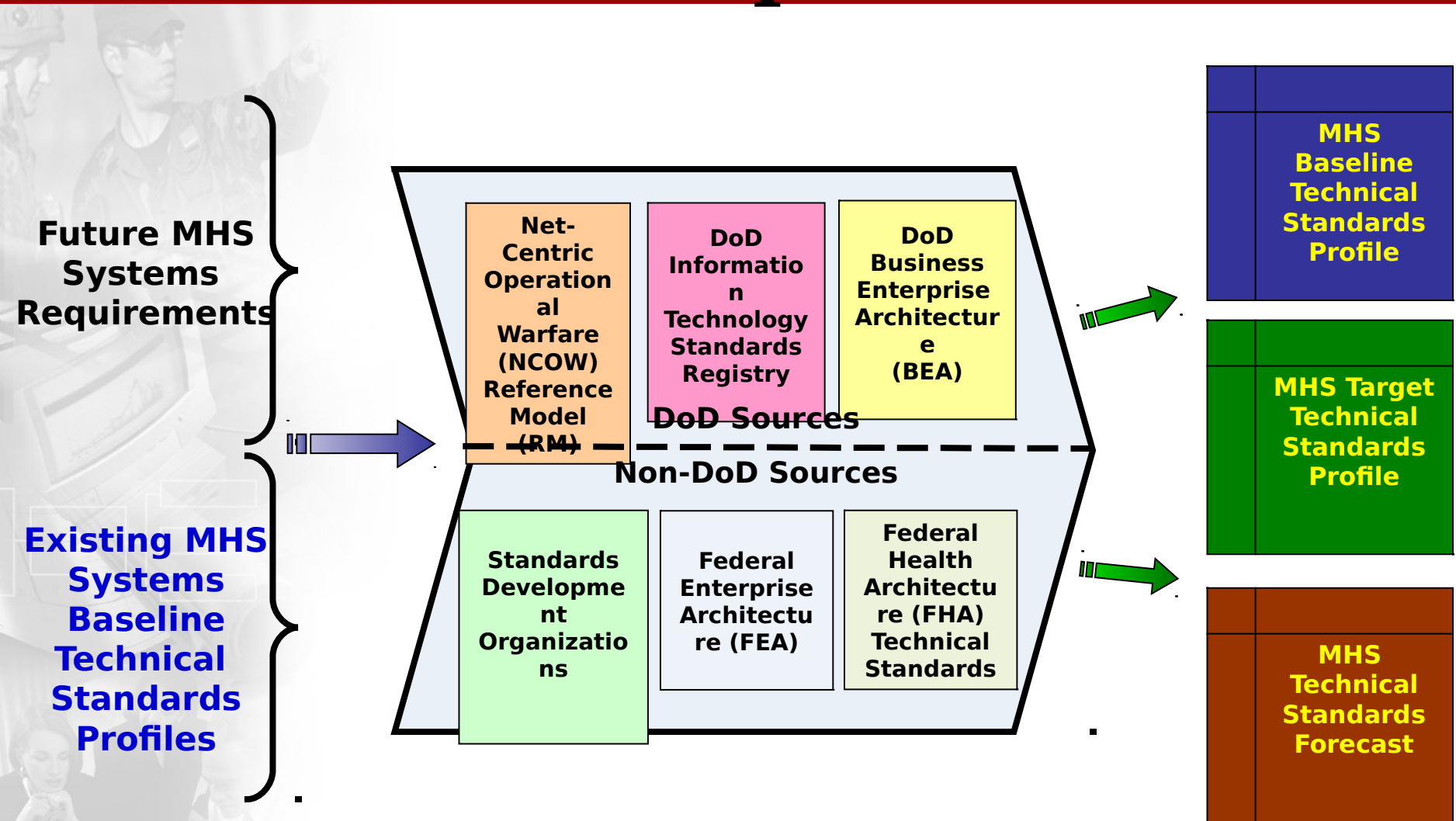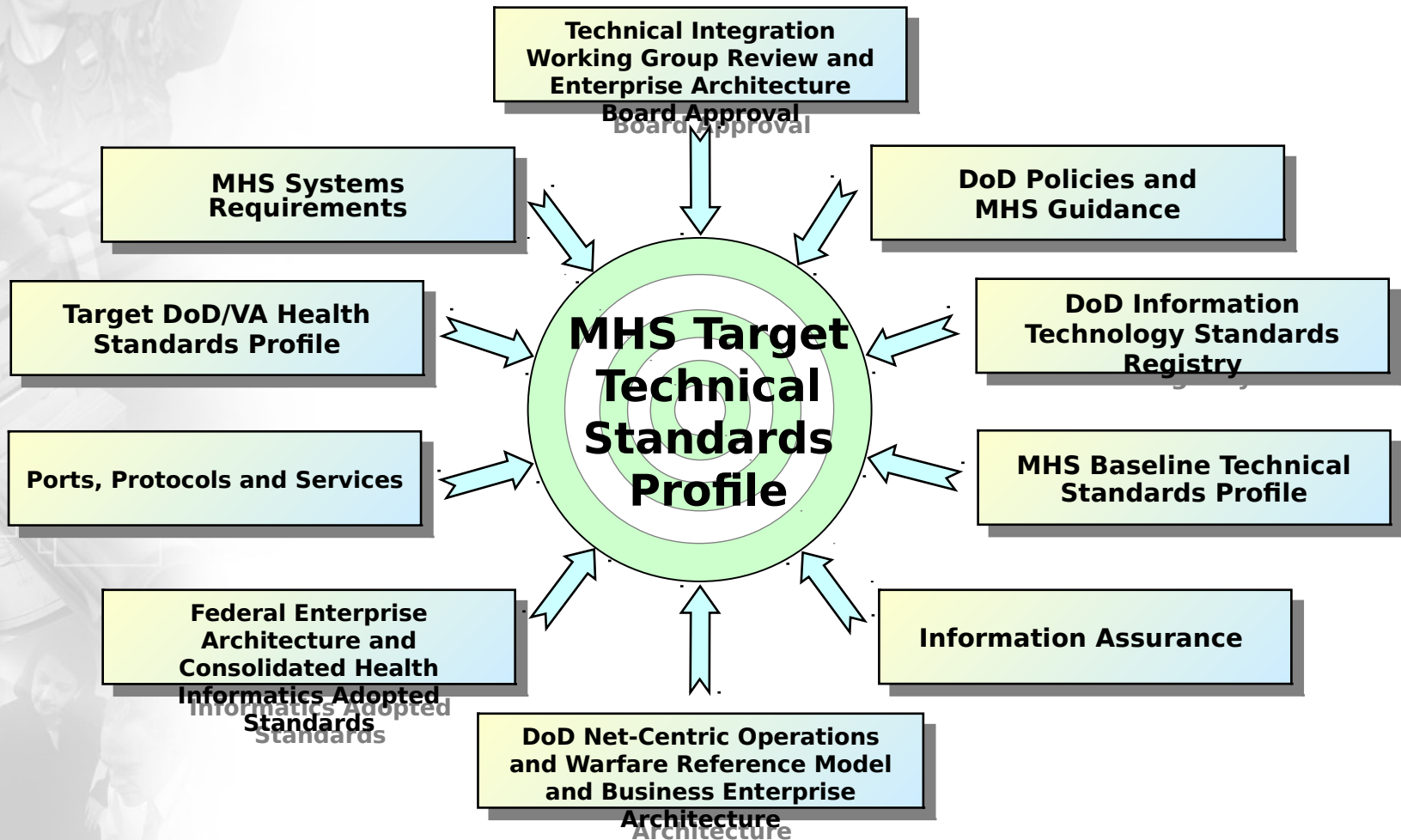CDC

CHI

DoD

TECHNICAL STANDARDS

Federal Health Architecture

TECHNICAL STANDARDS

HHS

NIST

Technical Standards Process

DoD Business Enterprise Architecture

DoD – VA Health Architecture

Standards Development Organizations

Federal Health Architecture Technical Standards

MHS Technical Integration Working Group
Standards Selection

DoD Information Technology Standards Registry

MHS Enterprise Architecture Board
MHS Coordination & Approval

DoD IT Standards Committee
Review & Recommend

DoD IT Standards Oversight Panel
Standards Approval

Technical Standards Product Development

Future MHS Systems Requirements

Existing MHS Systems Baseline Technical Standards Profiles

DoD Sources

- Net-Centric Operational Warfare (NCOW) Reference Model (RM)
- DoD Information Technology Standards Registry
- DoD Business Enterprise Architecture (BEA)

Non-DoD Sources

- Standards Development Organizations
- Federal Enterprise Architecture (FEA)
- Federal Health Architecture (FHA) Technical Standards

MHS Baseline Technical Standards Profile

MHS Target Technical Standards Profile

MHS Technical Standards Forecast

Target Technical Standards Profile

MHS Target Technical Standards Profile

- Technical Integration Working Group Review and Enterprise Architecture Board Approval
- MHS Systems Requirements
- DoD Policies and MHS Guidance
- Target DoD/VA Health Standards Profile
- DoD Information Technology Standards Registry
- Ports, Protocols and Services
- MHS Baseline Technical Standards Profile
- Federal Enterprise Architecture and Consolidated Health Informatics Adopted Standards
- Information Assurance
- DoD Net-Centric Operations and Warfare Reference Model and Business Enterprise Architecture

Information Assurance Architecture
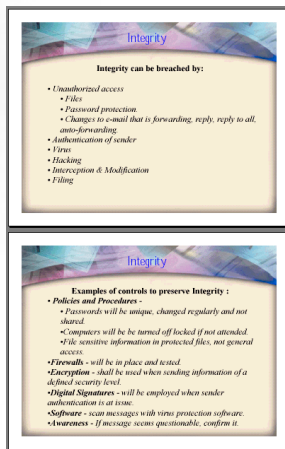

People

Process

Technology

Information

Define the protection mechanisms for the enterprise environment

Applying Information Assurance to Enterprise Architecture
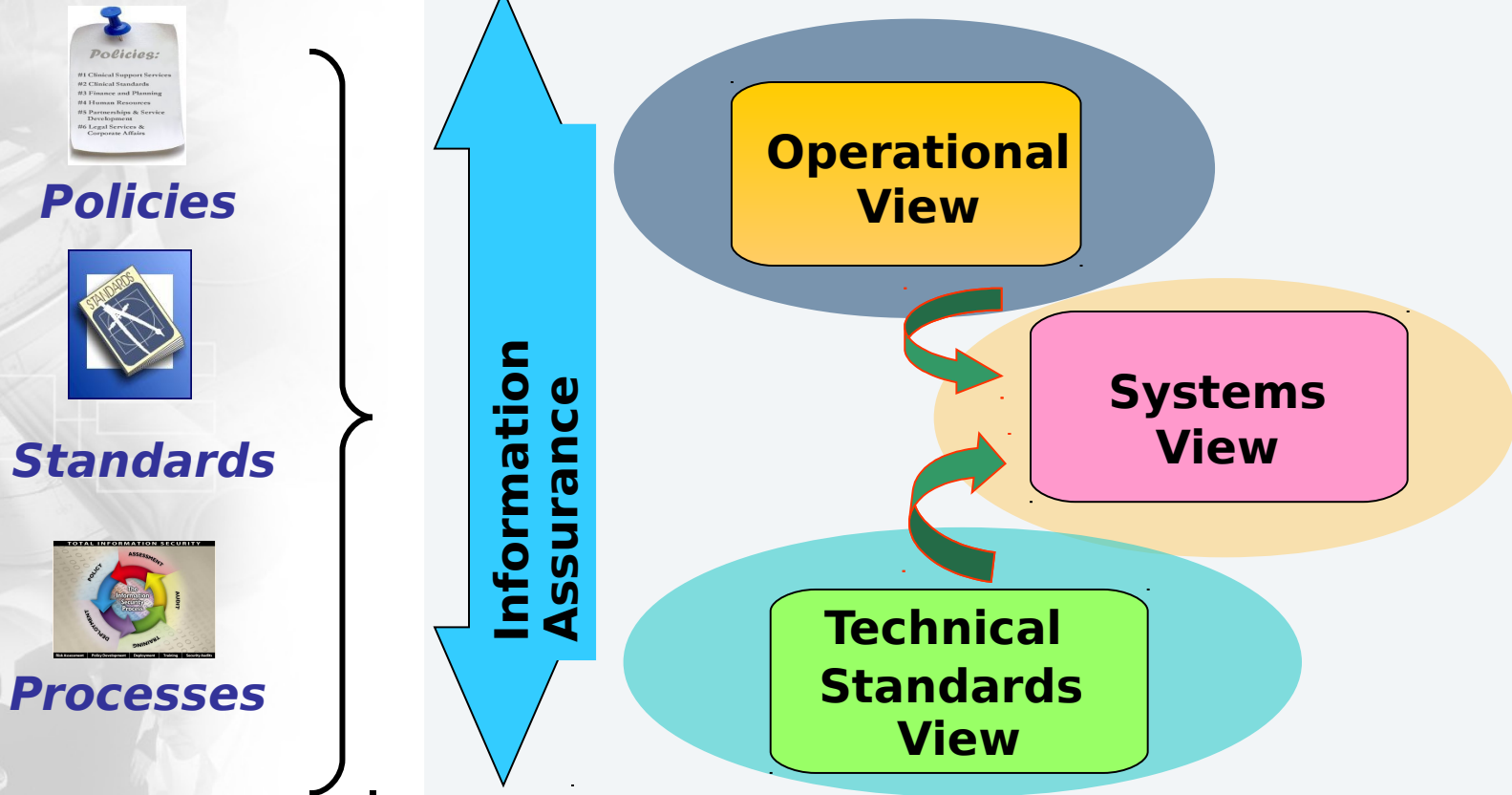
The Principles of Information Assurance are...

Confidentiality **Integrity** **Availability** **Authentication** **Non-repudiation**

Applying Information Assurance to Enterprise Architecture

...clearly in focus when developing the policies, standards and processes of the Enterprise Architecture...

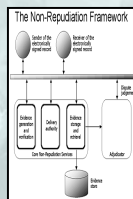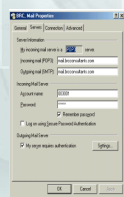## Military Health System Enterprise Architecture

Policies

Standards

Processes

Information Assurance

Operational View

Systems View

Technical Standards View

Applying Information Assurance to Enterprise Architecture

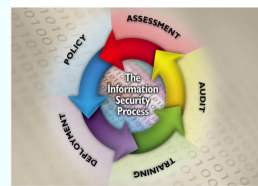## ...Ensures protection and security of Patient Information for the Military Health System!
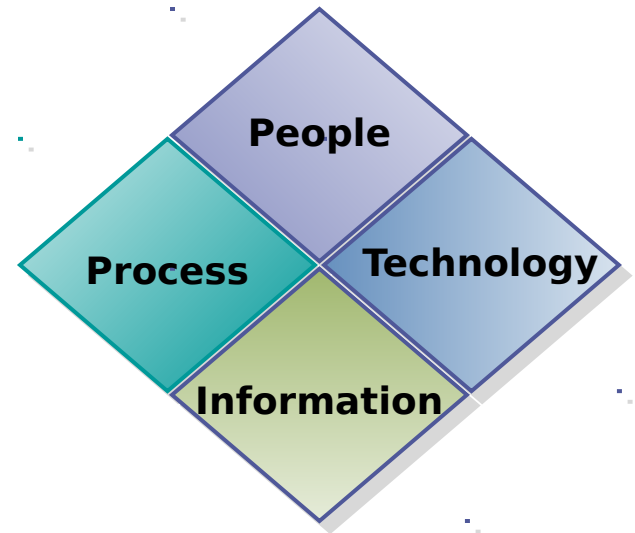

Principles of IA

Policies
Standards
Processes
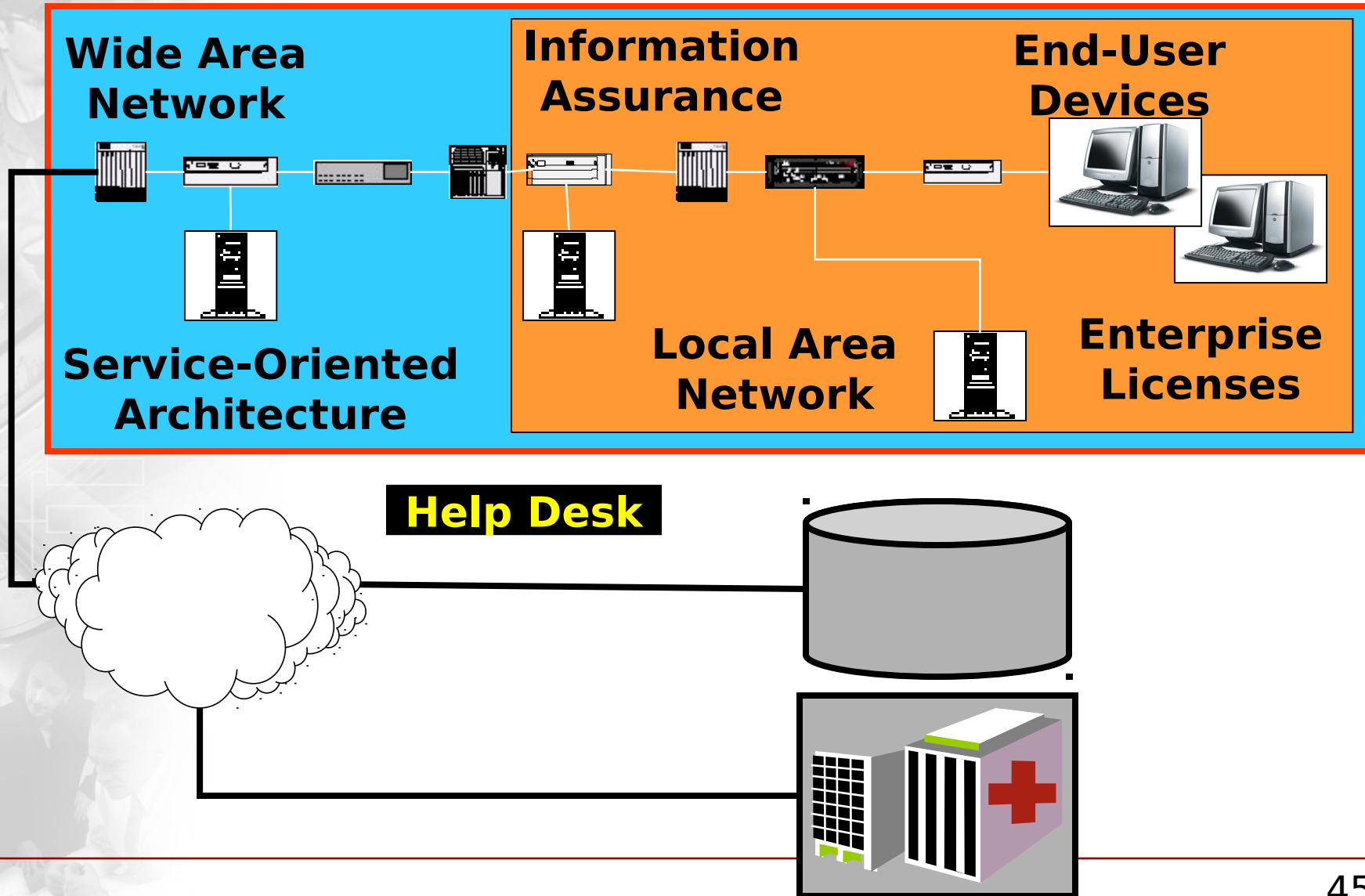
Summary

People

Process

Technology

Information

Enterprise Architecture is a disciplined approach to managing business modernization efforts and making sound IT investments

Military Health System Common Services

Wide Area Network

Service-Oriented Architecture

Information Assurance

Local Area Network

End-User Devices

Enterprise Licenses

Help Desk

What does this mean for you?

- **Understand EA constructs and uses**

- **Use EA common terminology**

- **Use standard contract language in procurements to drive technical, data, security, and communication interoperability**

- **Promote efficiencies through common services, enterprise licenses, and Services Oriented Architecture**

- **Leverage innovation and state-of-the shelf technologies**

- **Eliminate duplication and redundancies**

Contact Information

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- **Ms. Orvis – nancy.orvis@tma.osd.mil**
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- **http://www.tricare.osd.mil/architecture**